Kawasaki

KLX650R
KLX650

Motorcycle
Service Manual

Kawasaki Heavy Industries. Ltd. 1993
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LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
°C	degree(s) Celsius	r	revolution
DC	direct current	rpm	revolution (s) per minute
F	farad (s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot, feet	V	volt(s)
g	gram(s)	W	watt(s)
h	hour(s)	Q	ohm(s)
L	liter(s)		

Read OWNER'S MANUAL before operating.

Foreword

This Manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment are specified, do not use makeshift tools or equipment. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation.

For the duration of the warranty period, especially, we recommend that all repairs and scheduled maintenance be performed in accordance with this service manual. Any owner maintenance or repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your Motorcycle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles are introduced by the Special Tool Catalog or Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use this Manual

In preparing this manual, we divided the product into its major systems. These systems became the manual's chapters. All information for a particular system from adjustment through disassembly and inspection is located in a single chapter.

The Quick Reference Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

The Periodic Maintenance Chart is located in the General Information chapter. The chart gives a time schedule for required maintenance operations.

If you want spark plug information, for example, go to the Periodic Maintenance Chart first. The chart tells you how frequently to clean and gap the plug. Next, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Spark Plug section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

AWARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

o *This note symbol indicates points of particular interest for more efficient and convenient operation.*

• Indicates a procedural step or work to be done.

O Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.

•vindicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated crankcase emission (1) and exhaust emission (2) control systems in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board. Additionally, Kawasaki has incorporated an evaporative emission control system (3) in compliance with applicable regulations of the California Air Resources Board on vehicles sold in California only.

1. Crankcase Emission Control System
   This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the intake side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the carburetion system.
2. Exhaust Emission Control System
   This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel and ignition systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.
3. Evaporative Emission Control System
   Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped. Liquid fuel is caught by a vapor separator and returned to the fuel tank.

The Clean Air Act, which is the Federal law covering motor vehicle pollution, contains what is commonly referred to as the Act's "tampering provisions."

"Sec. 203(a) The following acts and the causing thereof are prohibited...

(3) (A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(3) (B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser..."

(Continued on next page.)

NOTE

o *The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows:*

1. Tampering does not include the temporary or rendering inoperative of devices or elements of design in order to perform maintenance.

2. Tampering could include:

a. Maladjustment of vehicle components such that the emission standards are exceeded.

b. Use of replacement parts or accessories which adversely affect the performance or durability of the motorcycle.

c. Addition of components or accessories that result in the vehicle exceeding the standards.

d. Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.

WE RECOMMEND THAT ALL DEALERS OBSERVE THESE PROVISIONS OF FEDERAL LAW, THE VIOLATION OF WHICH IS PUNISHABLE BY CIVIL PENALTIES NOT EXCEEDING $10,000 PER VIOLATION.

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below:

- Replacement of the original exhaust system or muffler with a component not in compliance with Federal regulations.
- Removal of the muffler(s) or any internal portion of the muffler(s).
- Removal of the air box or air box cover.
- Modifications to the muffler(s) or air intake system by cutting, drilling, or other means if such modifications result in increased noise levels.

Quick Reference Guide

This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.

1

General Information

Table of Contents

Before Servicing

Before starting to service a motorcycle, careful reading of the applicable section is recommended to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Dirt

Before removal and disassembly, clean the motorcycle. Any dirt entering the engine or other parts will work as an abrasive and shorten the life of the motorcycle. For the same reason, before installing a new part, clean off any dust or metal filings.

(2) Battery Ground (KLX650C)

Remove the ground (-) lead from the battery before performing any disassembly operations on the motorcycle. This prevents:

(a) the possibility of accidentally turning the engine over while partially disassembled.

(b) sparks at electrical connections which will occur when they are disconnected.

(c) damage to electrical parts.

(3) Installation, Assembly

Generally, instalaltion or assembly is the reverse of removel or disassembly. But if this Service Manual has installation or assembly procedures, follow them.

(4) Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them evenly in a cross pattern. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.

(5) Torque

When torque values are given in this Service Manual, use them. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(6) Force

Common sense should dictate how much force is necessary in assembly and disassembly. If a part seems especially difficult to remove or install, stop and examine what may be causing the problem. Whenever tapping is necessary, tap lightly using a rubber, wooden or plastic-faced mallet. Use an impact driver for screws (particularly for the removal of screws held by a locking agent) in order to avoid damaging the screw heads.

(7) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(8) High-Flash Point Solvent

A high-flash point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is Stoddard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.

(9) Gasket, O-Ring

Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

(10) Liquid Gasket, Non-Permanent Locking Agent

Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine oil passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Loctite Lock'n Seal (Blue).

(11) Press

A part installed using a press or driver, such as a wheel bearing (hub bearing), should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.

(12) *Ball Bearing,* Needle Bearing

Do not remove a ball bearing or a needle bearing unless it is absolutely necessary. Replace any ball or needle bearings that were removed with new ones, as removal generally damages bearings.

Install bearings with the marked side facing out applying pressure evenly with a suitable driver. Only press on the race that forms the press fit with the base component to avoid damaging the bearings. This prevents severe stress on the balls or needles and races, and prevent races and balls or needles from being dented.

Press a ball bearing until it stops at the stop in the hole or on the shaft.

(13) Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals.

When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole. Before a shaft passes through a seal, apply a little high temperature grease on the lips to reduce rubber to metal friction.

(14) Circlip, Retaining Ring

Replace any circlips and retaining rings that were removed with new ones, as removal weakens and deforms them. When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more.

(15) Cotter Pin

Replace any cotter pins that were removed with new ones, as removal deforms and breaks them.

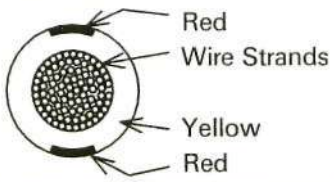
(16) Lubrication

Engine wear is generally at its maximum while the engine is warming up and before all the rubbing surfaces have an adequate lubricative film. During assembly, oil or grease (whichever is more suitable) should be applied to any rubbing surface which has lost its lubricative film. Old grease and dirty oil should be cleaned off. Deteriorated grease has lost its lubricative quality and may contain abrasive foreign particles.

Don't use just any oil or grease. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended. This manual makes reference to molybdenum disulfide grease (M0S2) in the assembly of certain engine and chassis parts. Always check manufacturer recommendations before using such special lubricants.

(17) Electrical Wires

Ail the electrical wires are either single-color or two-color and, with only a few exceptions, must be connected to wires of the same color. On any of the two-color wires there is a greater amount of one color and a lesser amount of a second color, so a two-color wire is identified by first the primary color and then the secondary color. For example, a yellow wire with thin red stripes is referred to as a "yellow/red" wire; it would be a "red/yellow" wire if the colors were reversed to make red the main color.

Wire (cross-section)	Name of Wire Color
	Yellow/Red

(18) Replacement Parts

When there is a replacement instruction, replace these parts with new ones every time they are removed. These replacement parts will be damaged or lose their original function once removed.

(19) Inspection

When parts have been disassembled, visually inspect these parts for the following conditions or other damage. If there is any doubt as to the condition of them, replace them with new ones.

Abrasion	Crack	Hardening	Warp
Bent	Dent	Scratch	Wear
Color change	Deterioration	Seizure	

(20) Specifications

Specification terms are defined as follows:

"Standards" show dimensions or performances which brand-new parts or systems have.

"Service Limits" indicate the usable limits. If the measurement shows excessive *wear or* deteriorated performance, replace the damaged parts.

Model Identification

KLX650-A1 (US Model)

KLX650-A1 (Europe Model)

KLX650-C1 (US Model)

KLX650-C1 (Europe Model)

General Specifications

Items		KLX650-A1
Dimensions:		
Overall length		2215 mm
Overall width		925 mm
Overall height		1230 mm
Wheelbase		1490 mm
Road clearance		330 mm
Seat height		950 mm
Dry weight		127 kg
Curb weight:	Front	63 kg
	Rear	74 kg
Fuel tank capacity		8 L
Performance:		
Minimum turning radius		-
Engine:		
Type		4-stroke, DOHC, 1-cylinder
Cooling system		Liquid - cooled
Bore and stroke		100.0 x 83.0 mm
Displacement		651 mL
Compression ratio		9.5: 1
Maximum horsepower		-
Maximum torque		-
Carburetion system		Carburetor, KEIHIN CVK40 x1
Starting system		Primary kick
Ignition system		CDI
Timing advance		Electronically advanced
Ignition timing		From 8° BTDC @1300 r/min (rpm) to 30° BTDC @3000 r/min (rpm)
Spark plug		NGK DPR8EA-9, ND X24EPR-U9
Cylinder numbering method		-
Firing order		-
Valve timing:		
Inlet	Open	19° BTDC
	Close	65°ABDC
	Duration	264°
Exhaust	Open	53° BBDC
	Close	27° ATDC
	Duration	260°
Lubrication system		Forced lubrication (wet sump)
Engine oil:		
Grade		SE or SF class
Viscosity		SAE10W-40,10W-50, 20W-40, or 20W-50
Capacity		1.9 L

Items		KLX650-A1
Drive Train:		
Primary reduction system:		
Type		Gear
Reduction ratio		2.272 (75/33)
Clutch type		Wet multi disc
Transmission:		
Type		5-speed, constant mesh, return shift
Gear ratios:	1st	2.266 (34/15)
	2nd	1.529 (26/17)
	3rd	1.181 (26/22)
	4th	0.954 (21/22)
	5th	0.791 (19/24)
Final drive system:		
Type		Chain drive
Reduction ratio		3.500 (49/14)
Overall drive ratio		6.290 @Top gear
Frame:		
Type		Tubular, semi double cradle
Caster (rake angle)		28.5°
Trail		122 mm
Front tire:	Type	Tube, D752F
	Size	80/100-21 51M
Rear tire:	Type	Tube, D752
	Size	110/100-18 64M
Front suspension:	Type	Telescopic fork (pneumatic)
	Wheel travel	300 mm
Rear suspension:	Type	Swingarm (uni-trak)
	Wheel travel	285 mm
Brake type:	Front	Single disc
	Rear	Single disc
Electrical Equipment:		
Headlight:	Type	Semi-sealed beam
	Bulb	12 V 30 W
Taillight		12V10W
Alternator:	Type	Three-phase AC
	Rated output	-

Specifications are subject to change without notice, and may not apply to every country.

Items		KLX650-C1
Dimensions:		
Overall length		2250 mm, (FG)(GR)(NR)(SD)(ST) 2265 mm (IT) 2285 mm
Overall width		900 mm
Overall height		1190 mm
Wheelbase		1510 mm
Road clearance		265 mm
Seat height		885 mm
Dry weight		153 kg, (CA) 154 kg
Curb weight:	Front	80 kg, (CA) 81 kg
	Rear	90 kg
Fuel tank capacity		12L
Performance:		
Minimum turning radius		2.4 m
Engine:		
Type		4-stroke, DOHC, 1-cylinder
Cooling system		Liquid - cooled
Bore and stroke		100.0 x 83.0 mm
Displacement		651 mL
Compression ratio		9.5:1
Maximum horsepower		33 kW (45 ps) @6500 r/min (rpm), (AR)20 kW (27 ps) @6000 r/min (rpm), (ST)20 kW (27 ps) @5000 r/min (rpm),
Maximum torque		53 N-m (5.4 kg-m, 39.1 ft-lb) @5000 r/min (rpm) (AR)44.5 N-m (4.5 kg-m, 32.5 ft-lb) @3000 r/min (rpm) (ST)40 N-m (4.1 kg-m, 29.6 ft-lb) @3500 r/min (rpm)
Carburetion system		Carburetor, KEIHIN CVK40 x1
Starting system		Electric starter
Ignition system		CDI
Timing advance		Electronically advanced
Ignition timing		5° BTDC @1300 r/min (rpm) to 31° BTDC @3000 r/min (rpm)
Spark plug		NGK DPR8EA-9, ND X24EPR-U9
Cylinder numbering method		-
Firing order		-
Valve timing:		
Inlet	Open	17° BTDC
	Close	63°ABDC
	Duration	260°
Exhaust	Open	53° BBDC
	Close	27° ATDC
	Duration	260°
Lubrication system		Forced lubrication (wet sump)
Engine oil:		
Grade		SE or SF class
Viscosity		SAE10W-40, 10W-50, 20W-40, or 20W-50
Capacity		2.1 L

Items		KLX650-C1
Drive Train:		
Primary reduction system:		
Type		Gear
Reduction ratio		2.272 (75/33)
Clutch type		Wet multi disc
Transmission:		
Type		5-speed, constant mesh, return shift
Gear ratios:	1st	2.266 (34/15)
	2nd	1.529 (26/17)
	3rd	1.181 (26/22)
	4th	0.954(21/22)
	5th	0.791 (19/24)
Final drive system:		
Type		Chain drive
Reduction ratio		2.866 (43/15)
Overall drive ratio		5.157 @Top gear
Frame:		
Type		Tubular, semi double cradle
Caster (rake angle)		28.5°
Trail		122 mm
Front tire:	Type	Tube, TRAILMAX, (AS) TRAILMAX J, (US) K850A
	Size	90/90-21 54S
Rear tire:	Type	Tube, TRAILMAX, (AS) TRAILMAX J, (US) K850AG
	Size	130/80-17 65S
Front suspension:	Type	Telescopic fork (pneumatic)
	Wheel travel	285 mm
Rear suspension:	Type	Swingarm (uni-trak)
	Wheel travel	260 mm
Brake type:	Front	Single disc
	Rear	Single disc
Electrical Equipment:		
Battery		12 V 8 Ah
Headlight:	Type	Semi-sealed beam
	Bulb	12 V 60/55 W (quartz-halogen)
Tail/brake light		12 V 5/21 W, (US) 12 V 8/27 W
Alternator:	Type	Three-phase AC
	Rated output	17 A/14 V @6000 r/min (rpm)

Specifications are subject to change without notice, and may not apply to every country.

(AR)	Austria Model
(AS)	Australia Model
(CA)	California Model
(FG)	Germany Model
(GR)	Greece Model
(IT)	Italy Model
(NR)	Norway Model
(SD)	Sweden Model
(ST)	Switzerland Model
(US)	U.S. Model

Periodic Maintenance Chart - KLX650A

The maintenance must be done in accordance with this chart to keep the motorcycle in good running condition.

FREQUENCY / OPERATION	Traveled Distance km(mi)				
	100 (60)	500 (300)	1000 (600)	1500 (900)	2000 (1200)
ENGINE					
Clutch -- adjust	●	●	●	●	●
Clutch and friction plates -- check*			●		●
Throttle cables -- adjust	●	●	●	●	●
Spark plug -- clean, gap*	●	●	●	●	●
Valve clearance -- check*					●
Air cleaner element -- clean	Every 300 km (200 mi) or Every Race				
Air cleaner element -- replace	If damaged				
Carburetor -- inspect/adjust	●	●	●	●	●
Spark arrestor (US) -- clean	Every 4000 km (2500 mi)				
Oil filter -- replace	●		●		●
Engine oil -- change	●		●		●
Engine sprocket -- check			●		●
Coolant -- change	Every 2 years				
Radiator hoses, connections -- check*			●		●
CHASSIS					
Brake adjustment -- check*	●	●	●	●	●
Brake pad wear -- check*		●	●	●	●
Brake fluid level -- check*		●	●	●	●
Brake fluid -- change	Every 2 years				
Brake master cylinder cup and dust seal -- replace	Every 2 years				
Brake caliper piston seal and dust seal -- replace	Every 2 years				
Brake hose -- replace	Every 4 years				
Spoke tightness and rim runout -- check*	●	●	●	●	●
Drive chain -- adjust	Every 300 km (200 mi)				
Drive chain -- lubricate	Before and after each day of operation				
Drive chain wear -- check*		●	●	●	●
Chain slipper and guide -- check*	If damaged				
Front fork -- inspect/clean	●	●	●	●	●
Front fork oil -- change	Every year				
Steering play -- check*	●	●	●	●	●
Steering stem bearing -- grease					●

(Continued on next page.)

FREQUENCY / OPERATION	Traveled Distance km(mi)				
	100 (60)	500 (300)	1000 (600)	1500 (900)	2000 (1200)
Rear sprocket -- check*		●	●	●	●
Wheel bearing -- check*					●
Swingarm and uni-trak linkage pivots -- grease		●	●	●	●
Swingarm and uni-trak linkage pivots -- check*		●	●	●	●
Rear shock oil -- replace	Every year				
ENGINE and CHASSIS					
Fuel system -- clean	●	●	●	●	●
Fuel hose -- replace	Every 4 years				
Nuts, bolts, fasteners -- check*	●		●		●
General lubrication -- perform	●	●	●	●	●

(*) : Replace, add, adjust, clean, or torque if necessary.
R : Replace
• : Service more frequently when operated in a race.
(US) : U.S. model

Periodic Maintenance Chart - KLX650C

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in good running condition. **The initial maintenance is vitally important and must not be neglected.**

FREQUENCY / OPERATION	Whichever comes first — Every	†ODOMETER READING 800km	5000km	10000km	15000km	20000km	25000km	30000km
Spark plug -- clean and gap*			●	●	●	●	●	●
Valve clearance -- check*		●		●		●		●
Air cleaner element -- clean		●		●		●		●
Air cleaner element -- replace	5 cleanings					●		
Throttle grip play -- check*		●		●		●		●
Idle speed -- check*		●	●	●	●	●	●	●
Fuel system -- check				●		●		●
Evaporative emission control system (CA) -- check*		●	●	●	●	●	●	●
Spark arrestor (US) -- clean			●	●	●	●	●	●
Engine oil -- change	year	●		●		●		●
Oil filter -- replace		●		●		●		●
Radiator hoses, connections-- check	year	●		●		●		●
Coolant -- change	2 years							●
Fuel hose -- replace	4 years							
Clutch -- adjust		●	●	●	●	●	●	●
Drive chain wear - check*			●	●	●	●	●	●
Drive chain -- lubricate	300 km							
Drive chain slack -- check*	800 km							
Brake pad wear -- check*			●	●	●	●	●	●
Brake fluid level -- check*	month	●	●	●	●	●	●	●
Brake fluid -- change	2 years					●		
Brake hose and pipe -- replace	4 years							
Brake master cylinder cup and dust seal -- replace	2 years							
Caliper piston seal and dust seal -- replace	2 years							
Brake light switch --check*		●	●	●	●	●	●	●
Steering play -- check*		●	●	●	●	●	●	●

FREQUENCY / OPERATION	Whichever comes first → Every	†ODOMETER READING							
		800 km	5000 km	10000 km	15000 km	20000 km	25000 km	30000 km	
Steering stem bearing -- lubricate	2 years					●			
Front fork oil -- change								●	
Tire wear -- check*			●	●	●	●	●	●	
Spoke tightness and rim runout -- check*		●	●	●	●	●	●	●	
Swingarm pivot , uni-trak linkage -- lubricate				●		●		●	
General lubrication -- perform			●	●	●	●	●	●	
Nut, bolt, and fastener tightness -- check*		●		●		●		●	

(t): For higher odometer readings, repeat at the frequency interval established here.
(*): Replace, add, adjust, clean, or torque if necessary.

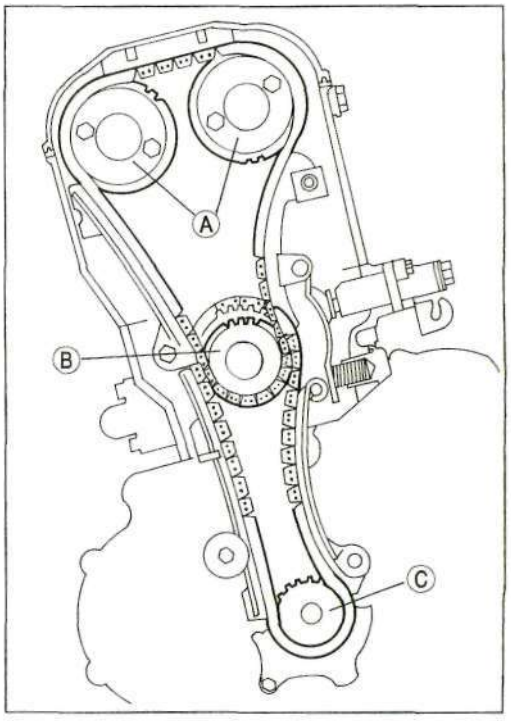
(CA) : California Model
(US) : U.S. Model

Technical Information 1 - Two - Stage Cam Drive System

By unsing a two-stage camshaft chain drive on this double overhead-cam engine, the camshaft sprockets can be made smaller.

Accordingly, the space between the camshafts can be narrowed for a better looking design, allowing the KLX650 to have such a compact engine that does not seem to have double overhead cams.

Cam Sprocket [A]
Intermediate Sprockets [B]
Crank Sprocket [C]



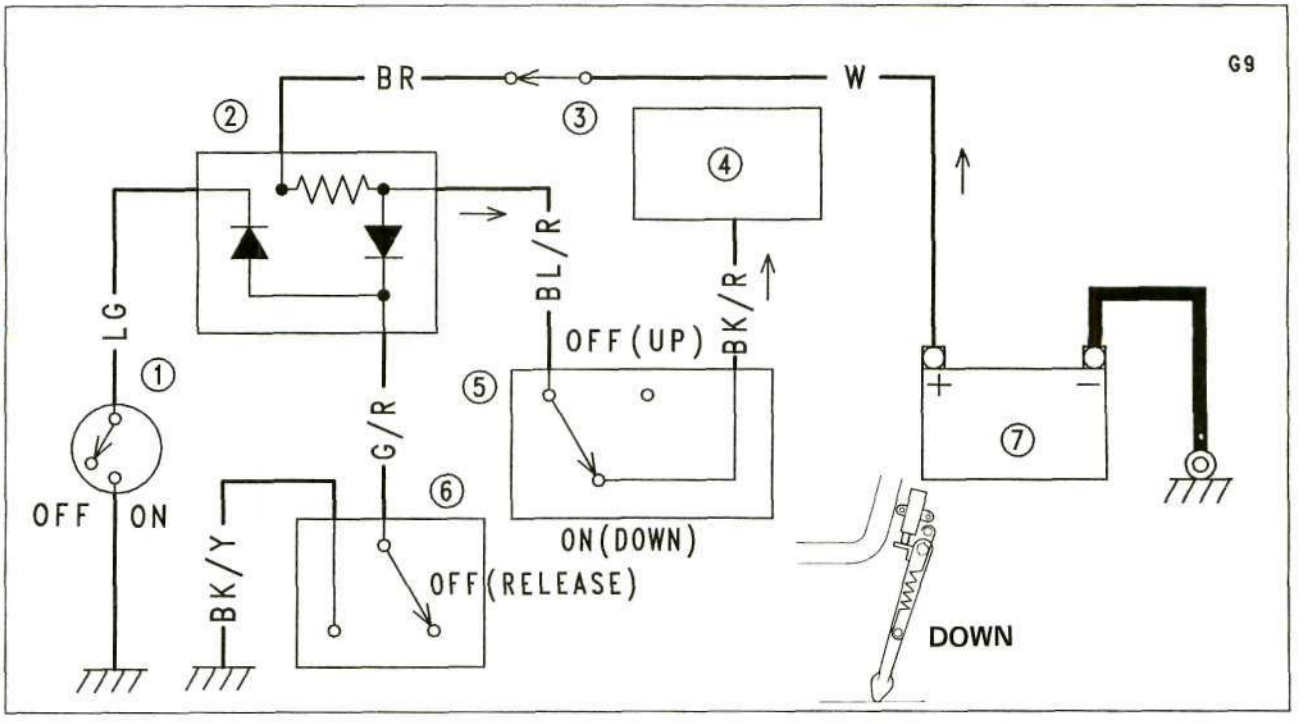
Technical Information 2 - Interlock Circuit (KLX650C)

The interlock circuit is designed so the motorcycle will not run when the side stand is down. The side stand switch is operated by the side stand, and kills the engine by preventing ignition.

When Side Stand is Down:

When the side stand is down, the side stand switch is turned ON and micro current flows into the CDI unit and stops ignition sparks.

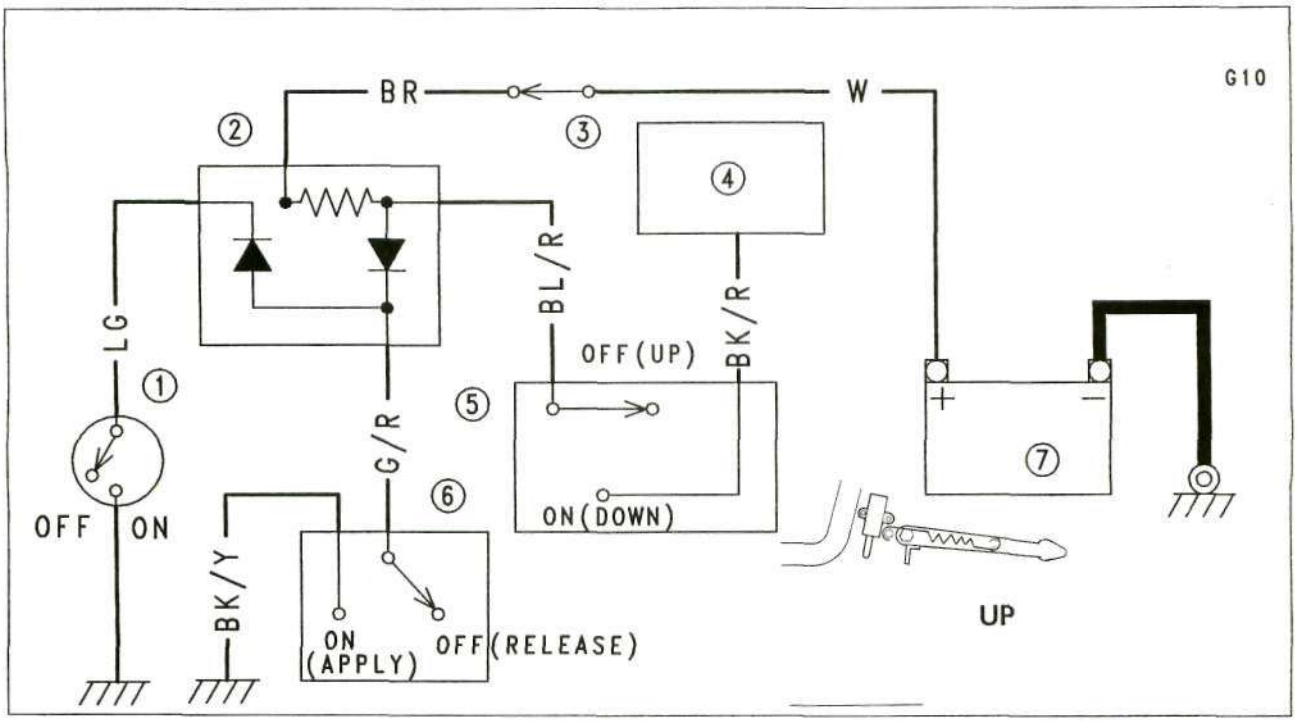
At this time, if the clutch lever is applied (starter lockout switch ON) or if the transmission is in neutral, the micro current is grounded and the ignition system can work. But the ignition system will not work and the motorcycle can not run with the transmission in gear and with the clutch lever released for moving off.



1. Neutral Switch
2. Diode Unit
3. Ignition Switch
4. CDI Unit
5. Side Stand Switch
6. Starter Lockout Switch
7. Battery

When Side Stand is Up:

When the side stand is up, the side stand switch is turned OFF and the ignition system can work.



Summary:

The interlock circuit controls the ignition system and the starter system as follows. After all, the new system (closed stop type) has the same operation as the conventional system (open stop type).

New System

Side Stand Switch	Starter Lockout Switch	Neutral Switch	Starter Starting	Engine Ignition
When side stand is down	When clutch lever is applied	ON	**O**	O
ON	ON	OFF	**O**	O
	When clutch lever is released	ON	**O**	O
	OFF	OFF	x	x
When side stand is up	When clutch lever is applied	ON	**O**	*O*
OFF	ON	OFF	**O**	O
	When clutch lever is released	ON	**O**	**O**
	OFF	OFF	x	**O**

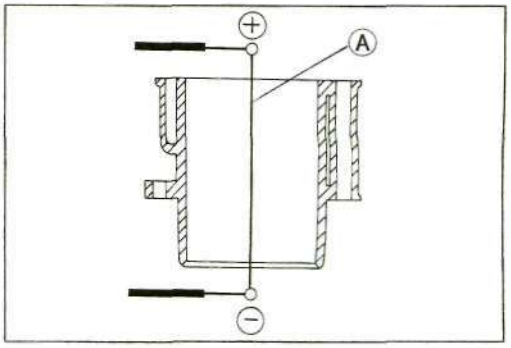
Conventional System

Side Stand Switch	Starter Lockout Switch	Neutral Switch	Starter Starting	Engine Ignition
When side stand is down	When clutch lever is applied	ON	**O**	**O**
OFF	ON	OFF	**O**	**O**
	When clutch lever is released	ON	**O**	**O**
	OFF	OFF	x	x
When side stand is up	When clutch lever is applied	ON	**O**	**O**
ON	ON	OFF	**O**	**O**
	When clutch lever is released	ON	**O**	**O**
	OFF	OFF	x	**O**

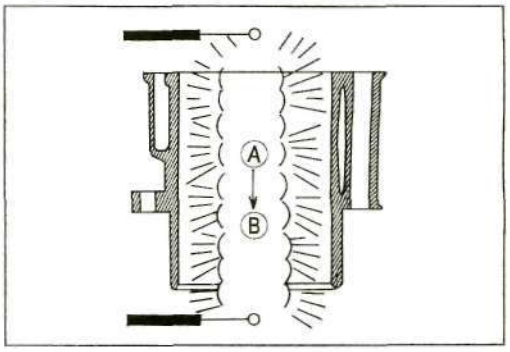
O : work **x** : will not work

Technical Information 3 - Electrofusion Cylinder (KLX650A)

Electrofusion is a steel-molybdenum manufacturing treatment of the cylinder bore. The process involves using high voltage to alternately explode thin high-carbon steel wires [A] and thin molybdenum wires directly inside the aluminum cylinder bore.



Multiple explosions apply alternating layers of molybdenum and high-carbon steel. First, a 20000 volt current detonates a 1 mm molybdenum wire [A], spraying it onto the inner surfaces of the cylinder. This is repeated. Then 15000 volts passes through a 2 mm carbon steel wire [B], spraying it onto the cylinder wall. This entire three-explosion process is repeated more than 30 times to apply the Electrofusion coating.

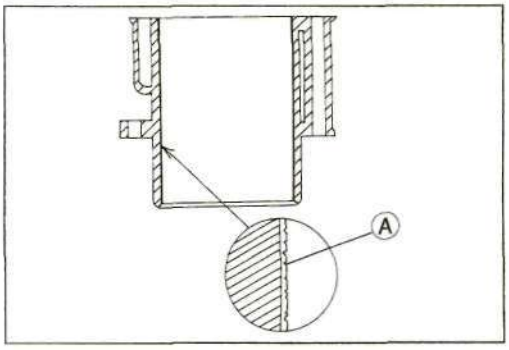


Features:

The wire materials fuse directly to the cylinder wall, forming a coating that has many advantages over conventional steel-lined or chrome-plated cylinder bores. Electrofusion is **VERY HARD** and **RESISTS WEAR,** but **is** also **POROUS ENOUGH TO HOLD A LUBRICATING FILM OF OIL.**

Hard and Porous Surface [A]

Since the coating is placed directly on the aluminum cylinder walls, electrofusion cylinders are very **LIGHTWEIGHT.** The electrofusion layer is an excellent conductor of heat, transferring heat to the cylinder evenly, without hot spots. The **EVEN HEAT TRANSFER** means the piston and cylinder expand at about the same rate, so **CLOSE PISTON TO CYLINDER TOLERANCES CAN BE MAINTAINED, REDUCING BLOW-BY AND INCREASING POWER.**



Benefits:

Electrofusion resists abrasion and seizure. It allows the use of closer tolerances and leaner carburetion for better fuel economy and lower exhaust emissions. In competition models, it permits higher engine performance.

Torque and Locking Agent

The following tables list the tightening torque for the major fasteners requiring use of a non-permanent locking agent or liquid gasket.

Letters used in the "Remarks" column mean:
- L : Apply a non-permanent locking agent to the threads.
- LG : Apply liquid gasket to the threads.
- Lh : Left-hand threads.
- M : Apply molybdenum disulfide grease.
- O : Apply an oil to the threads and seating surface.
- S : Tighten the fasteners following the specified sequence.
- SS : Apply silicone sealant.
- St : Stake the fasterners to prevent loosening.
- R : Replacement parts.

650A: KLX650A
650C:KLX650C

The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

Basic Torque for General Fasteners

Threads dia. (mm)	Torque		
	N-m	kg-m	ft-lb
5	3.4 - 4.9	0.35 - 0.50	30 - 43 in-lb
6	5.9 - 7.8	0.60 - 0.80	52 - 69 in-lb
8	14 - 19	1.4-1.9	10.0 - 13.5
10	25 - 34	2.6 - 3.5	19.0 - 25
12	44 - 61	4.5 - 6.2	33 - 45
14	73 - 98	7.4 - 10.0	54 - 72
16	115-155	11.5-16.0	83-115
18	165 - 225	17.0 - 23.0	125-165
20	225 - 325	23 - 33	165 - 240

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Fuel System:				
Carburetor Holder Bolts	12	1.2	104 in-lb	
Fuel Tap Plate Screws	0.8	0.08	7 in-lb	
Fuel Tap Bolts (650C)	5.9	0.60	52 in-lb	
Cooling System:				
Radiator Hose Clamp Screws	2.0	0.20	17 in-lb	
Reserve Tank Bolts				L
Coolant Drain Plug (water pump)	8.8	0.90	78 in-lb	
Thermostatic Fan Switch (650C)	8.8	0.90	78 in-lb	
Coolant Temperature Switch (650C)	8.8	0.90	78 in-lb	
Water Pump Impeller Nut	8.8	0.90	78 in-lb	
Water Pump Cover Bolts	8.8	0.90	78 in-lb	
Engine Top End:				
Spark Plug	14	1.4	10.0	
Cylinder Head Cover Bolts	9.8	1.0	87 in-lb	
Oil Separator Bolts	5.9	0.60	52 in-lb	
Chain Tensioner Mounting Bolts	8.8	0.90	78 in-lb	
Chain Tenisoner Cap	25	2.5	18.0	
Chain Tension Spring Bolt	15	1.5	**11.0**	
Camshaft Cap Bolts	12	1.2	104 in-lb	S
Camshaft Sprocket Bolts	15	1.5	**11.0**	L
Water Hose Clamp Screws	2.0	0.20	17 in-lb	
Water Hose Fitting Bolts	8.8	0.90	78 in-lb	
Timing Inspection Plug	2.5	0.25	22 in-lb	
Magneto Flywheel Bolt Plug	2.5	0.25	22 in-lb	

Fastener	Torque			Remarks
	lll-m	kg-m	ft-lb	
10 mm Engine Mounting Bolts and Nuts	44	**4.5**	33	
8 mm Engine Mounting Bolts and Nuts	29	**3.0**	22	
Oil Pipe Bolt	8.8	0.90	78 in-lb	
Oil Pipe Banjo Bolts	20	**2.0**	14.5	
Cylinder Head Bolts $10	49	5.0	36	**S, M** (washer, threads)
Cylinder Head Allen Bolts $8	34	**3.5**	25	S
Cylinder Head Nuts 08	25	**2.5**	18.0	S
Cylinder Head Nuts <J>6	7.8	0.80	69 in-lb	S
Cylinder Head Ja<;ket Plug	20	**2.0**	14.5	
Camshaft Chain I-lolder Bolts	8.8	0.90	78 in-lb	
Front Lower Chain Guide Bolts	8.8	0.90	78 in-lb	
Rear Lower Chain Guide Bolts	8.8	0.90	78 in-lb	L
Front Upper Chaiii Guide Bolts	29	**3.0**	22	
Rear Upper Chain Guide Bolt	**29**	**3.0**	22	
Intermediate Sprocket Shaft Plug	3.4	0.35	30 in-lb	
Cylinder Bolts $8	18	1.8	13.0	
Cylinder Nuts q>8	25	**2.5**	18.0	**S**
Carburetor Holder Bolts	12	**1.2**	104 in-lb	
Clutch:				
Primary Gear Nut	155	16.0	115	
Oil Filter Cover Bolts	8.8	0.90	78 in-lb	
Clutch Cover Bolts	8.8	0.90	78 in-lb	
Clutch Cable Bracket Bolt	8.8	0.90	78 in-lb	
Clutch Cover Damper Bolts (650C)	5.9	0.60	52 in-lb	L
Oil Pressure Relief Valve	15	1.5	11.0	L
Main Oil Passage Plug	25	**2.5**	18.0	
Crankshaft Oil Seal Retainer Screw	**4.9**	0.50	43 in-lb	
Clutch Spring Bo ts	8.8	0.90	78 in-lb	
Clutch Hub Nut	130	13.5	98	R
Kickstarter Stoppe;r Bolts	8.8	0.90	78 in-lb	
Kick Pedal Screw	-	**-**	-	ST
Kick Pedal Allen Bolt	-	**-**	-	ST
Engine Lubrication System:				
Oil Filler Plug	1.5	0.15	13 in-lb	
Engine Drain Plug	29	**3.0**	22	
Engine Drain Allen Bolt	25	**2.5**	18.0	
Oil Filter Bolts	**8.8**	0.90	78 in-lb	
Oil Pressure Relief Valve	15	1.5	11.0	L
Clutch Cover Oil Pump Bolts	12	**1.2**	104 in-lb	
Oil Pump Cover Screws (Crankcase Pump)	4.9	0.50	43 in-lb	
Oil Pump Screw (Crankcrse Pump)	4.9	0.50	43 in-lb	L
Oil Pipe Banjo Bolts	20	**2.0**	14.5	
Oil Pipe Bolt	8.8	0.90	78 in-lb	
Oil Passage Plug	25	**2.5**	18.0	
Engine Removal/Installation:				
10 mm Engine Mounting Bolts and Nuts	44	**4.5**	33	
8 mm Engine Mounting Bolts and Nuts	29	**3.0**	22	
Swingarm Pivot Nut	88	9.0	65	

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Crankshaft/Transmission:				
Engine Drain Plug	**29**	**3.0**	22	
Engine Drain Allen Bolt	**25**	**2.5**	18.0	
Crankcase Bolts 08 mm	**25**	**2.5**	18.0	
ø6 mm Allen	**12**	**1.2**	104 in-lb	
ø6 mm	**9.8**	1.0	87 in-lb	
Kickstarter Stopper Bolts (650A)	**8.8**	0.90	78 in-lb	
Main Bearing Retainer Screws	**4.9**	0.50	43 in-lb	L
Bearing Retainer Screws	**4.9**	0.50	43 in-lb	
Primary Gear Nut	155	16.0	115	
Magneto Flywheel Bolt (650A)	120	12.0	87	M (seating surface)
Magneto Flywheel Bolt (650C)	**216**	**22**	159	M (seating surface)
Starter Motor Clutch Bolts (650C)	**34**	**3.5**	25	L
Rear Camshaft Chain Guide Bolts	**8.8**	0.90	78 in-lb	
Magneto Case Allen Bolts (650C)	**12**	**1.2**	104 in-lb	L(1)
External Shift Mechanism Cover Bolts	**8.8**	0.90	78 in-lb	
Engine Sprocket Nut	**98**	10.0	72	
Gear Positioning Lever Nut	**8.8**	0.90	78 in-lb	
Shift Shaft Return Spring Pin (Bolt)	**29**	**3.0**	22	L
Neutral Switch (650C)	15	1.5	11.0	
Shift Drum Cam Bolt	**12**	**1.2**	104 in-lb	L
Wheels/Tires:				
Front Axle	88	9.0	65	S
Front Axle Clamp Nuts	**9.3**	0.95	82 in-lb	S
Rear Axle Nut	**98**	10.0	72	
Tire Air Valve Nuts	1.5	0.15	13 in-lb	
Spoke Nipples	1.5 **-2.1**	0.15 ~ 0.21	13 ~ 18 in-lb	
Final Drive:				
Rear Axle Nut	98	10.0	72	
Engine Sprocket Cover Bolt				L(1)
Engine Sprocket Nut	98	**10.0**	72	
Rear Sprocket Nuts (650A)	**29**	**3.0**	22	
Rear Sprocket Nuts (650C)	**32**	**3.3**	24	
Rear Sprocket Studs				L
Brakes:				
Bleed Valves	**7.8**	0.80	69 in-lb	
Brake Hose Banjo Bolts	**25**	**2.5**	18.0	
Brake Pipe Banjo Bolts	**25**	**2.5**	18.0	
Brake Pipe Joint Br lts	**9.8**	1.0	87 in-lb	
Brake Lever Pivot Locknut	5.9	0.60	52 in-lb	
Brake Lever Pivot Bolt	5.9	0.60	52 in-lb	
Brake Lever Adjuster Locknut	**5.9**	0.60	52 in-lb	
Front Brake Light Switch Screws (650C)	1.1	0.11	10 in-lb	
Front Master Cylinder Clamp Bolts	**8.8**	0.90	78 in-lb	
Front Brake Reservoir Cap Screws	1.5	0.15	13 in-lb	
Rear Brake Reservoir Cap Screws	1.5	0.15	13 in-lb	
Caliper Bolts (Front)	**25**	**2.5**	18.0	
Brake Pad Bolts	18	1.8	13.0	
Front Disc Bolts (650A)	**9.8**	1.0	87 in-lb	
Front Disc Bolts (650C)	**23**	**2.3**	16.5	

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Rear Disc Bolts	23	2.3	16.5	
Rear Master Cylinder Bracket Locknut	18	1.8	13.0	
Suspension:				
Front Fork Air Screws	1.2	0.12	10 in-lb	
Front Fork Upper Clamp Bolts	20	2.0	14.5	
Front Fork Lower Clamp Bolts	25	2.5	18.0	
Front Fork Top Plugs	29	3.0	22	
Push Rod Nut	15	1.5	11.0	
Front Fork Bottom Allen Bolts	54	**5.5**	40	L
Rear Shock Absorber Bolts	39	4.0	29	
Swingarm Pivot Nut	88	9.0	65	
Uni-Trak				
Rocker Arm Nut	98	10.0	72	
Tie-rod Nuts	81	8.3	60	
Steering:				
Steering Stem Head Nut	44	4.5	33	
Steering Stem Nut	Hand-Tight or 3.9	Hand-Tight or 0.40	Hand-Tight or 35 in-lb	
Handlebar Clamp Bolts	**25**	2.5	18.0	
Handlebar Switch Housing Screws	**3.5**	0.36	31 in-lb	
Front Fork Upper Clamp Bolts	21	2.1	15.0	
Front Fork Lower Clamp Bolts	24	2.4	17.5	
Electrical System:				
Spark Plug	**14**	1.4	10.0	
Pickup Coil Screws	2.5	0.25	•22 in-lb	
Magneto Cover Bolts	8.8	0.90	78 in-lb	L(1),650A
Magneto Cover Damper Bolts (650C)	8.8	0.90	78 in-lb	L
Magneto Case Allen Bolts (650C)	12	1.2	104 in-lb	L(1)
Timing Inspection Plug	2.5	0.25	22 in-lb	
Magneto Stator Bolts (650A)	8.8	0.90	78 in-lb	
Magneto Stator E olts (650C)	12	1.2	104 in-lb	
Lead Clamp Sere'*ns*	2.5	0.25	22 in-lb	
Magneto Flywhe*i*\ Bolt (650A)	120	12.0	87	M (Seating surface)
Magneto Flywhe 3l Bolt (650C)	**216**	22.0	159	R, M (Seating surface)
Starter Motor Terminal Locknut (650C)	11	1.1	95 in-lb	
Starter Motor Terminal Nut (650C)	4.9	0.50	43 in-lb	
Starter Relay Terminal Nut (650C)	4.9	0.50	43 in-lb	
Starter Motor Through Bolts (650C)	4.9	0.50	43 in-lb	
Starter Motor Mounting Bolts (650C)	8.8	0.90	78 in-lb	
Starter Clutch Bolts (650C)	34	**3.5**	25	L
Thermostatic Fan Switch (650C)	8.8	0.90	78 in-lb	
Coolant Temperature Switch (650C)	8.8	0.90	78 in-lb	
Neutral Switch (650C)	**15**	1.5	11.0	